Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands	)	ET Docket No. 95-183 (Terminated)
	)	
Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands	)	PP Docket No. 93-253 (Terminated)
	)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42.0-43.5 GHz Band	)	RM-11664

REPLY COMMENTS OF ECHOSTAR SATELLITE OPERATING CORPORATION, HUGHES NETWORK SYSTEMS, LLC, AND ALTA WIRELESS, INC.

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I. INTRODUCTION

EchoStar Satellite Operating Corporation ("ESOC"), Hughes Network Systems, LLC ("Hughes"), and Alta Wireless, Inc. ("Alta" and collectively, "EchoStar") submit these reply comments in response to the FCC's Notice of Inquiry (the "Spectrum Frontiers NOI").[1] The record in this proceeding clearly indicates that 5G use of the spectrum resource is still years off, despite some early testing.[2] Accordingly, any determination of shared use of the spectrum for next-generation mobile radio services ("5G") needs to have the 5G technology further defined, and then will require extensive sharing analyses to create a regulatory framework which enables 5G and incumbent services to share the spectrum and for all services to be able to expand.[3]

Moreover, the record also demonstrates that much of the spectrum above 24 GHz is being utilized extensively for a myriad of critical services, including consumer broadband, emergency response and backhaul, among others.[4] The record further demonstrates that in certain bands that are lightly utilized today, such as 37.0-42.5 GHz ("V band") an the 24 GHz reverse band satellite service ("RBSS"), greater use of these bands will be made in the future as regulatory certainty is

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[1] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al*., Notice of Inquiry, FCC 14-154 (rel. Oct. 17, 2014).

[2] *See, e.g., Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al*., GN Dkt No. 14-177, RM-11664, Comments of Verizon at 2 (filed Jan. 15, 2015) ("While a substantial amount of work is being done that may eventually lead to commercial uses of one or more above-24 GHz spectrum bands, it is currently unclear what technologies an business models may eventually emerge for those frequencies."); GN Dkt No. 14-177, RM-11664, Comments of 4G Americas at 3 (filed Jan. 15, 2015) (. . . "much more research and development by industry is needed before 5G is deployed . . .").

[3] Despite the FCC's clear goal of enabling spectrum sharing, the wireless industry instead suggests the need for exclusive use of spectrum for its 5G services. *See* GN Dkt No. 14-177, RM-11664, Comments of CTIA – The Wireless Association at 8-10 (filed Jan. 15, 2015).

[4] *See*, *e.g.*, GN Dkt No. 14-177, RM-11664, Comments of Satellite Industry Association (filed Jan. 15, 2015) (detailing use of spectrum above 24 GHz for satellite communications services) ("SIA Comments"), *and* GN Dkt No. 14-177, RM-11664, Comments of Bluewan SA (filed Dec. 14, 2014) (describing multipoint services in the 40.5-43.5 GHz bands).

created and/or if the FCC gives users of the band greater flexibility.[5] Accordingly, the FCC should foster an environment that allows these uses to mature, as it must also do with 5G, before looking to enable the introduction of new services that are not well-defined.

However, the record does identify one frequency band where the FCC can move forward to enable greater spectrum efficiency and can serve as a model for other bands. This is the 27.5-28.35 GHz, 29.1-29.25 GHz band ("28 GHz band"), where local multipoint distribution service ("LMDS") operates on a primary basis and fixed satellite service ("FSS") operates on a secondary basis (i.e., 27.5-28.35 GHz band). The record demonstrates that moving forward with a rulemaking to provide LMDS operators with greater flexibility to provide mobile services and allow co-primary use by FSS gateway stations will achieve several important FCC goals including obtaining greater spectrum efficiency, promoting fixed and mobile broadband services and enabling the use of spectrum by innovative technologies.[6]

II. DISCUSSION

A. The FCC Must Ensure That Sufficient Spectrum Is Available For All Critical Communications Services

The record in this proceeding demonstrates the important uses that are already being made or being planned to be made in the frequency bands above 24 GHz, especially by satellite service providers. For example, today in the frequencies in the Ka-band, satellite providers are utilizing the spectrum to provide broadband services to U.S. consumers, wherever they are, through high-throughput satellites.[7] The record further demonstrates that sharing among radio services is already being made in many of these frequency bands. For example, in the LMDS

[5] *See* SIA Comments at 8-9.

[6] *See infra* section II.B.

[7] SIA Comments at 8.

band, sharing is already occurring between satellite and fixed wireless, resulting in consumers receiving a vast number of services.

However, sharing among radio services is largely dependent on the technical characteristics of the service. This is where this proceeding is at loggerheads as the record clearly demonstrates that 5G is not yet-well defined, and the record is inconclusive on how sharing can work in a manner that enables existing services in the band the flexibility they need to grow as consumer demand warrants.[8] Accordingly, it is still very early to define a sharing environment for 5G services that will enable the use of the band by both 5G and incumbent services in a manner that creates the regulatory certainty that is necessary for all services to be able to grow.

In addition, in several bands that the FCC identified as possible bands for sharing, including the V-band and the 24 GHz RBSS, the use of these bands is only beginning either because of the lack of regulatory certainty or because the technology is only just starting to be made available. In these bands, it would be premature both based on the development of 5G and the development of incumbent services, to enable the use of these bands on a shared basis for 5G services. Instead, the FCC should continue to support the use of these bands for their planned services to ensure that the benefits the FCC originally foresaw are able to be recognized by U.S. consumers. Accordingly, the FCC should not move forward with sharing for 5G services in frequency bands where there is not a sufficient technical basis available to create a regulatory framework.

[8] *See supra* n. 2.

B. The 28 GHz Band Can Serve as a Test Case

Although the FCC should proceed cautiously in moving forward in enabling a regulatory regime for 5G services, the record demonstrates regulatory reform is warranted in the frequencies that are currently utilized by the LMDS services --- the 28 GHz band. There is overwhelming support to have increased use of the spectrum.[9] First, the band is being used by LMDS operators today, but operators could use the band more successfully if they had the flexibility for mobile service use that the FCC foresaw. As the FCC has previously recognized, additional authority to provide 5G services could greatly enhance the services that LMDS operators are able to provide their customers.[10] By enabling existing licensees to offer a wider variety of terrestrial services, the FCC would increase the efficient use of these frequencies and facilitate the introduction of more dynamic and diverse service offerings to current and prospective customers of LMDS operators. Further, in geographic areas where no LMDS operator is licensed, the FCC should examine whether 5G service deployment would be appropriate and, if so, how best to assign licenses.

[9] *See* GN Dkt No. 14-177, RM-11664, Comments of Qualcomm Incorporated at 16 (filed Jan. 15, 2015), GN Dkt No. 14-177, RM-11664, Comments of Samsung Electronics America, Inc. and Samsung Research America at 42 (filed Jan. 15, 2015); GN Dkt No. 14-177, RM-11664, Comments of Motorola Mobility LLC at 7 (filed Jan. 15, 2015); GN Dkt No. 14-177, RM-11664, Comments of XO Communications, LLC at 3 (filed Jan. 15, 2015), GN Dkt No. 14-177, RM-11664, Comments of Nokia (d/b/a Nokia Solutions and Networks US LLC) at 31 (filed Jan. 15, 2015); GN Dkt No. 14-177, RM-11664, Comments of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC and Alta Wireless, Inc. at 23 (filed Jan. 15, 2015) ("EchoStar Comments").

[10] Spectrum Frontiers NOI ¶ 53 ("While the Commission has not, to date, authorized any specific service (including LMDS) to provide mobile service in those bands, it did express an expectation that it would expand the LMDS authorization for Fixed service to include Mobile service if proposed and supported by the resulting record.").

Moreover, as the Commission and satellite operators noted, the 27.5-28.35 GHz portion 28 GHz band is already being utilized on a secondary basis for FSS gateway stations.[11] In addition, as the record demonstrates, it would be in the public interest to have FSS elevated to a co-primary basis, with appropriate sharing rules put into place.[12] The demand for broadband FSS continues to grow and requires that operators have greater and more certain access to additional gateway spectrum.

However, EchoStar does not support the use of the 28 GHz band for FSS user terminals. There is no way to enable such a use without causing harmful interference to incumbent LMDS operators. As demonstrated in the record, the LMDS band is a prime example of how satellite and terrestrial frequency bands can be shared effectively.[13] Any FCC proposal should not seek to undo or otherwise jeopardize these sharing arrangements – which enabling the use of the 28 GHz band for FSS user terminals would do. Existing satellite operators, as well as those developing systems, must have regulatory certainty about their continued access to this spectrum for both existing and new gateway earth stations.[14] The FCC should consider in a rulemaking

[11] *See* Spectrum Frontiers NOI ¶¶ 54-55 ("[T]here appears to be considerable satellite use of [the 27.5-28.35 GHz] band."); *see also* SIA Comments at 8.

[12] *See* GN Dkt No. 14-177, RM-11664, Joint Comments of SES Americom, Inc., Intelsat Corporation, O3b Networks USA LLC, and Inmarsat, Inc. at 2 (filed Jan. 15, 2015); EchoStar Comments at 24.

[13] *See* EchoStar Comments at 23. In the Ka-band, geostationary orbit and non-geostationary orbit satellites and terrestrial services, both commercial and government, all share a discrete amount of spectrum in the United States to offer consumers and government users broadband and other important services.

[14] *See, e.g., Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands, Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations,* Second Report and Order, 18 FCC Rcd 25428 ¶ 54 (2003) ("We recognize that both Government and commercial systems

proceeding how to make the most efficient use of this shared band in a way that supports all existing services.

Specifically, as EchoStar recommended in its comments, the FCC should examine whether to change the current secondary allocation for satellite uplinks for gateway stations in the LMDS band, specifically 27.5-28.35 GHz, to a co-primary allocation and take some additional measures to ensure that such stations can continue to operate and expand when 5G services also are authorized in the band.[15] Because of the small number of gateway stations that are required to operate with an FSS system, another simple way to enable continued shared use is to have a first-in-time, first-in-right approach, which the FCC has adopted in numerous spectrum proceedings.[16] Thus, once a gateway station is installed and in operation, new systems, providing 5G services in current LMDS bands, will have to take this into account so as to not suffer interference from such FSS operations.[17] Such sharing could be managed through the use of databases and smart technologies and lead to substantially increased use of the LMDS band on a shared basis, consistent with the FCC's vision for more efficient spectrum use. Other options

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must remain sufficiently sure of their access to orbital and spectrum resources if they are to proceed with research, development and production of their planned space-station systems.").

[15] EchoStar Comments at 24.

[16] *See, e.g., The Establishment of Policies and Service Rules for the Broadcasting-Satellite Service at the 17.3-17.7 GHz Frequency Band*, Second Report and Order, 26 FCC Rcd 8927, 8935 ¶13 (2011) ("When satellite services share a frequency band on such an equal basis, new space station entrants are required to avoid causing harmful interference to incumbent operators, and radio stations/facilities are protected based on the order in which the license applications are either received or authorized."); *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band* Report and Order and Second Report and Order, 25 FCC Rcd 11710, 11787 ¶ 186 (2010) ("[A]s is typically the case when co-primary services coordinate, we find a first-in, first-protected coordination approach is appropriate to address future AMT deployments."). This type of approach is also adopted in other countries, including, for example, Canada.

[17] FSS should not be burdened with protecting LMDS once they are licensed for this gateway location.

should also be explored, including those that rely on cognitive radios and database management that would provide all users with the ability to expand their services.[18]

The implementation of a rulemaking in the 28 GHz band would clearly advance the FCC's goals on increasing spectrum efficiency and enabling the use of spectrum for mobile broadband services, while accommodating broadband satellite services. Accordingly, EchoStar urges the FCC to initiate such a rulemaking immediately.

[18] In addition, the FCC should explore the use of soft band segmentation, such as that used in the 37.5-42.5 GHz band. *See Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands*, Second Report and Order, 18 FCC Rcd 25428, 25453 ¶ 54 (2003).

III. CONCLUSION

Based on the support in the comments submitted in this proceeding, the FCC should initiate a rulemaking on permitting terrestrial mobile use in the 28 GHz band and on elevating satellite uplinks for gateway stations in the lower LMDS band (27.5-28.35 GHz) from a secondary to a co-primary allocation. Further examination of these proposals is in the public interest as it will ultimately lead to the more efficient use of spectrum and expansion of broadband services. However, outside of the 28 GHz band, the comments do not provide a sufficient basis for the FCC to move forward with implementing 5G in the bands above 24 GHz at this time.

Respectfully submitted,

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